Advancements in Electronic Government

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Outline

- Introduction
- Stages of E-Government Development
- Trend Shifts
    - Extracting Business Rules
    - Customized Workflow Generation
    - Workflow Execution
    - Business Location Service
- Research at UMBC
- Conclusions and the Future work

Introduction

- In the past years, there has been a noticeable shift in the way government is using technology to provide services and disseminate information.

- The change has begun with larger governments and is slowly moving to the local and county organizations which closely interact with citizens.

Definition and goals

- E-government can be defined by the following goals:

  - Electronically or Internet-based website

    - Secure and protected documents.
  - 24 hours a day; seven days a week.

  - Distribution of services and information to citizens.
    - Online government interaction to allow businesses to register.
    - Maintain security to prevent users from "Google" searching and retrieving this private information
    - Recent Washington Post article: http://www.washingtonpost.com/wp-dyn/articles/A24053-2004Feb8.html

Stages of E-Government development

This model provides a manner to measure the development of an organization's structure.

1. **Catalog** – Users can view or download brochures, forms, and other static information.

2. **Transactional** – Possess the ability to exchange information with users and accept payments

Stages of E-government Development

3. **Vertical Integration**
   - Allow businesses to interact with various departments from one government to register electronically.

4. **Horizontal Integration**
   - Complete transactions with various levels of government.
   - Allow businesses to request permits/services from state and federal governments.

Research Topics in E-Gov

- Customized workflow generation
- Decentralized workflow management
- Automatic execution of the workflow

E-government for State Business Services

Current Situation

Opening a New Business and registering with the government

HOW is it Done?

An Example

- Registering a business with the state government in New Jersey using the Internet.

- This solution can later be used on a broader scale with government agencies such as the One NASA project to link several sectors together.

Steps to Do

- Determine Your Type of Business
- Register Your Business's Name and File Original Business Certificate
- Obtain the Licenses and Permits You Will Need
- Obtain Information about Environmental, Health, and Safety Issues
- Learn about Unclaimed Property Reporting Requirements
- Register Your Business for Tax and Employer Purposes

Agencies Regulation

REGISTRATION FORMS AND INFORMATION

Applicants who are registering as **Sole Proprietors or Partnerships must** file pages 15-17 of the NJ-REG.

Revenue the Business Registration Form (NJ-REG) and if applicable, the appropriate public information form that is part of the NJ-REG. After registering, businesses will receive the forms, returns, instructions and other information required for on-going compliance with New Jersey State taxes. If you are registering for the first time,

If a business requires spray painting more than 1/2 gallon in an hour, it requires **air quality permit** and DMV permit.

Commercial Recording/Corporate File Unit, need only complete pages 15-17. There is no need to complete pages 21 and 22 of the package if you have successfully filed with Commercial Recording. Applicants who are

If location is in Meadowlands jurisdiction require permit to develop from the NJ Development Commission

Please note that the **Public Records Filing** (pages 21 and 22)may be submitted prior to the completion of pages 15-17 of the NJ-REG to establish the Business Entity,but the remainder of NJ-REG (pages 15-17)must be submitted within 60 days of filing the new business entity.

Is there a way to (semi) automatically extract these regulations from forms, documents and web pages?

Research Goal 1:

Automated Creation of a Business Ontology

Ontology (Gr. *on, ontos*) – reflects a community's consensus on a useful way to conceptualize a particular domain (hard, usually the task is done manually.)

Ontology Process

STEP 1: Term Discovery

REGISTRATION FORMS AND INFORMATION

[[This_DT packet_NN]] ((contains_VBZ)) [[information_NN]] and_CC
((forms_VBZ)) [[you_PRP]] ((will_MD need_VB)) ((to_TO register_VB))
[[your_PRP$ business_NN]] with_IN [[the_DT State_NNP]] of_IN [[New_NNP
Jersey_NNP]],_, [[Division_NNP]] of_IN [[Revenue_NNP]]._.

By_IN completing_VBG and_CC filing_VBG [[a_DT NJ-REG_NNP]] with_IN

[[the_DT Division_NNP]] of_IN [[Revenue_NNP]],_, [[a_DT business_NN]]
((will_MD be_VB registered_VBN)) for_IN [[applicable_JJ taxes_NNS]] and_CC
[[related_JJ liabilities_NNS]] [[that_WDT]] ((are_VBP administered_VBN)) by_IN
[[the_DT Department_NNP]] of_IN [[Labor_NNP]] and_CC [[Division_NNP]] of_IN
[[Taxation_NNP]],_, as_IN well_RB as_IN [[those_DT]] of_IN [[the_DT
Secretary_NNP]] of_IN [[State_NNP]]._.

Ontology Process

STEP 2: Determine Equivalence between terms

```
[[credit card]] == ||(|| [[master card]] [[visa]] [[discover]] ||)||
[[employer's federal employer identification number]] = ||(|| [[fein]] ||)||
[[electronic funds transfer]] == ||(|| [[eft]] ||)||
[[business entities]] [[i.e.]] [[foreign or domestic corporations]] <<,>>
                                [[partnerships]] <<,>>
                                [[limited liability companies]]
                                [[limited liability partnerships]]

[[alternate name]] == ||(|| [[business]] ||)||
```

Menu:

308	compani	a company the company company companies
309	treasur	the treasurer treasurer
310	deduct	a deduction deductions no deductions deduction the deductions the deduction deducting no deduction this deduction
311	a	s
312	commission	the commissioner
313	insur	insurance the insured an insurer the insurer insurers
314	insur compani	insurance companies
315	realti transfer fee	realty transfer fee the realty transfer fee
316	record	recording records record a record these records

Ontology Process

STEP 3: Determine Relations between terms

```
mysql> select * from relation_instances where relation_id='hasAttribute' or
relation_id='hasPart' ;
+--------------+-----------+------------------------+
| relation_id  | first_term | second_term           |
+--------------+-----------+------------------------+
| hasPart      | address   | street                 |
| hasPart      | address   | number                 |
| hasAttribute | business  | trade name             |
| hasPart      | address   | city                   |
| hasPart      | address   | zip                    |
| hasPart      | address   | state                  |
| hasAttribute | business  | business location      |
| hasAttribute | business  | business code          |
| hasAttribute | business  | registration number    |
| hasAttribute | person    | social security number |
| hasAttribute | person    | last name              |
| hasAttribute | person    | first name             |
| hasAttribute | person    | title                  |
| hasAttribute | person    | home address           |
+--------------+-----------+------------------------+
14 rows in set (0.01 sec)
```

Ontology Process
STEP 4: Obtain the Business Rules

ID	BUSINESS RULE	TASK	AGENCY
1	If kind_bus=Incorporation	certificate of incorp	Dept of State
2	If kind_bus= Autobody Shop	DMV Permit	DMV
3	If kind_bus involves Spray_paint > ½ gallon per hr	Air Quality Permit	DEP
4	If location is in the Meadowlands jurisdiction	Apply for development	NJ Meadowlands Commission

How can we make use of the automatically extracted regulations?
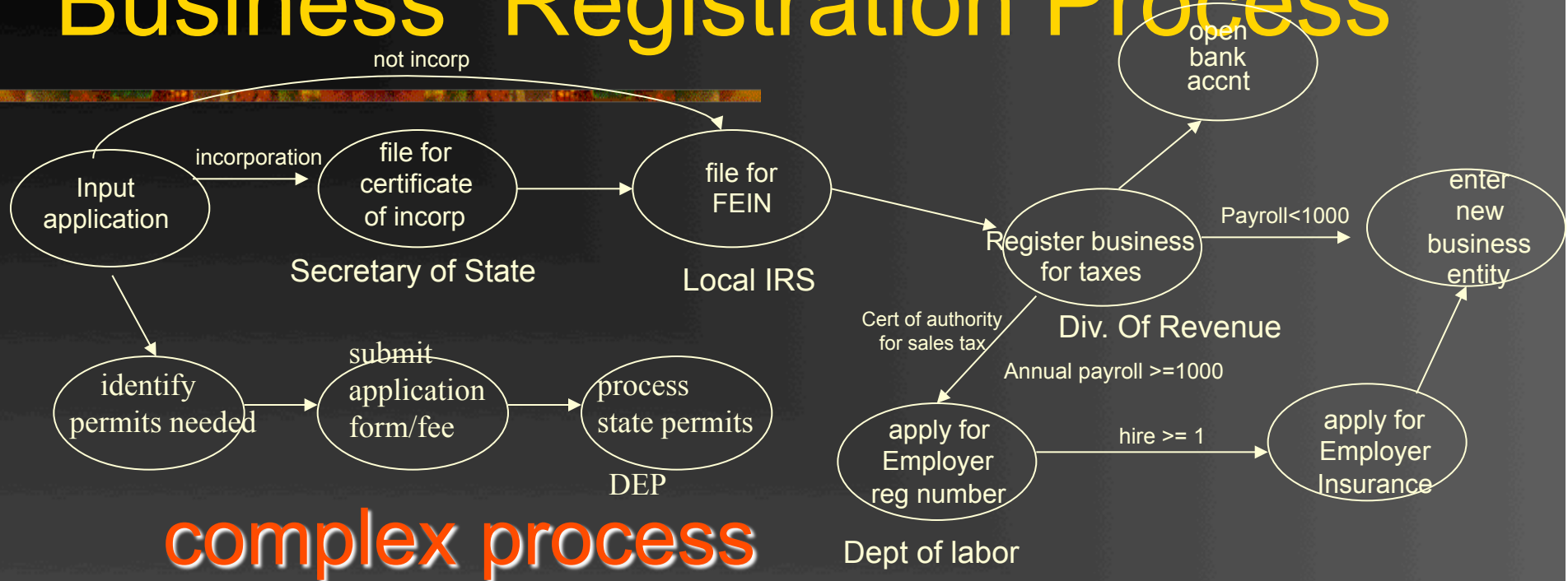
Research Goal 2: Customized Workflows

- ◆ generate the exact steps required for the specific business type, and the sequence in which they need to be executed, and by which agency (we call this a workflow)

- ◆ Guide Entrepreneurs through various steps involved by automatically identifying agencies and forms for a specific business.

Customized Workflow generation

Advantages:

- Direct the user to the correct agencies' forms and existing online services

- Find the correct order

- Customization on each specific business

- Transparent to the entrepreneur

- Easy to understand

Business Registration Process

complex process

- Geographically and functionally dispersed agencies
- Entrepreneurs interact with each agency
- duplicate information is submitted for each agency

With Customized Workflow Generation …

The user is directed to the correct forms and online services

WHAT IS NEXT?

Fill in Data and Send data to the agency

Fill in the form

WORKFLOW

Register For Business → **Fuel Seller Permit** →

Mail to: PO Box 308
Trenton, NJ 08625

Overnight to: 225 West State St.
3rd Floor
Trenton, NJ 08608-1001

STATE OF NEW JERSEY
DIVISION OF REVENUE

PUBLIC RECORDS FILING FOR NEW BUSINESS ENTITY

Fill out all information below INCLUDING INFORMATION FOR ITEM 12, and sign in the space provided. Please note that once filed, this form constitutes your original certificate of incorporation/formation/registration/authority, and the information contained in the filed form is considered public. Refer to the instructions for delivery/return options, filing fees and field-by-field requirements. Remember to remit the appropriate fee amount. Use attachments if more space is required for any field, or if you wish to add articles for the public record.

1. **Business Name:** Pietro's Italian Autobody shop

2. **Alternate Business Name:** My Autobody

3. **Type of Business Entity:** __ __ __
(See Instructions for Codes, Page 19, Item 3)
PA

4. **Business Purpose :**
(See Instructions, Page 20, Item 4)

5. **Stock** (Domestic Corporations Only - Total Shares): 1000

6. **Duration** (If Indefinite or Perpetual, Leave Blank):

7. **State of Formation/Incorporation** (Foreign Entities Only): New Jersey

8. **Date of Formation/Incorporation** (Foreign Entities Only): 10 / 05 / 2001

9. **Contact Information:**
Registered Agent Name: Pietro Mazzoleni

Registered Office
(Must be a New Jersey address with street address)

Main Business or Principal Business Address
(If different than the Registered Office)

Street 59 New Street

Street 180 University Avenue

City Newark Zip 07102

City Newark State NJ Zip 07102

Application Required by
NJ Motor Fuel Tax Law

DIVISION OF TAXATION
MOTOR FUEL TAX
PO BOX 189
Trenton, New Jersey 08695-0189

APPLICATION FOR SELLER - USER'S LICENSE

Complete this application to request a Seller-User's License which is needed whenever "special fuels" (diesel, kerosene, LP gas, #2 fuel oil, home heating oil, etc.) are purchased or sold within the State of New Jersey. This license is for a period of three (3) years. A payment of the fee of $150.00 must accompany this application. There is no fee to holders of New Jersey Motor Fuel Retail Dealer, Wholesale Dealer or Distributor Licenses. In general, every Seller-User's license is subject to the filing of a bond in such form and amount as provided by law. Make check or money order payable to: STATE OF NEW JERSEY-MFT.

1. **FID #** 02-1112331 OR Soc. Sec. # of Owner [ ][ ]-[ ][ ]-[ ][ ][ ][ ]

2. **Name** Pietro's Italian Autobody shop
(IF INCORPORATED - give Corp. Name; IF NOT - give Last name, First Name, MI of Owner(s))

3. **Trade Name**

4. **Business Location:**
Street 180 University Avenue
City NEWARK State NJ
Zip Code [ ][ ][ ][ ][ ]-[ ][ ][ ][ ]
(Give 9-digit Zip)

5. **Mailing Name and Address** - (if different from business address)
Name Pietro Mazzoleni
Street 600 Broad Street
City Newark State NJ
Zip Code 07102-[ ][ ][ ][ ]
(Give 9-digit Zip)

4a. **Business Location:** ☐ Owned   ☐ Leased

4b. If leased please provide name and address of owner:
Name Soon ae Chun
Address 600 Broad Street

6. **Beginning Date for this business in New Jersey** 10 / 05 / 2001
Month Day Year

7. **Type of Ownership** (check one):
☒ NJ Corporation ☐ Sole Proprietor ☐ Partnership ☐ Out-of-State Corporation ☐ Limited Partnership
X
☐ Other - explain

Our Work:

How to avoid redundant insertion of the same data in different forms or online services?

Interactive PDF Forms
FDF Data

Issues to deal with

- **Help the user with automatically filling existing online service forms and pdf forms**
- Save time
- Error-checking
- Built on the existing systems
- Allow to automatically extract data from forms

Our Work:

Is there a way to automatically process the entrepreneur's applications?
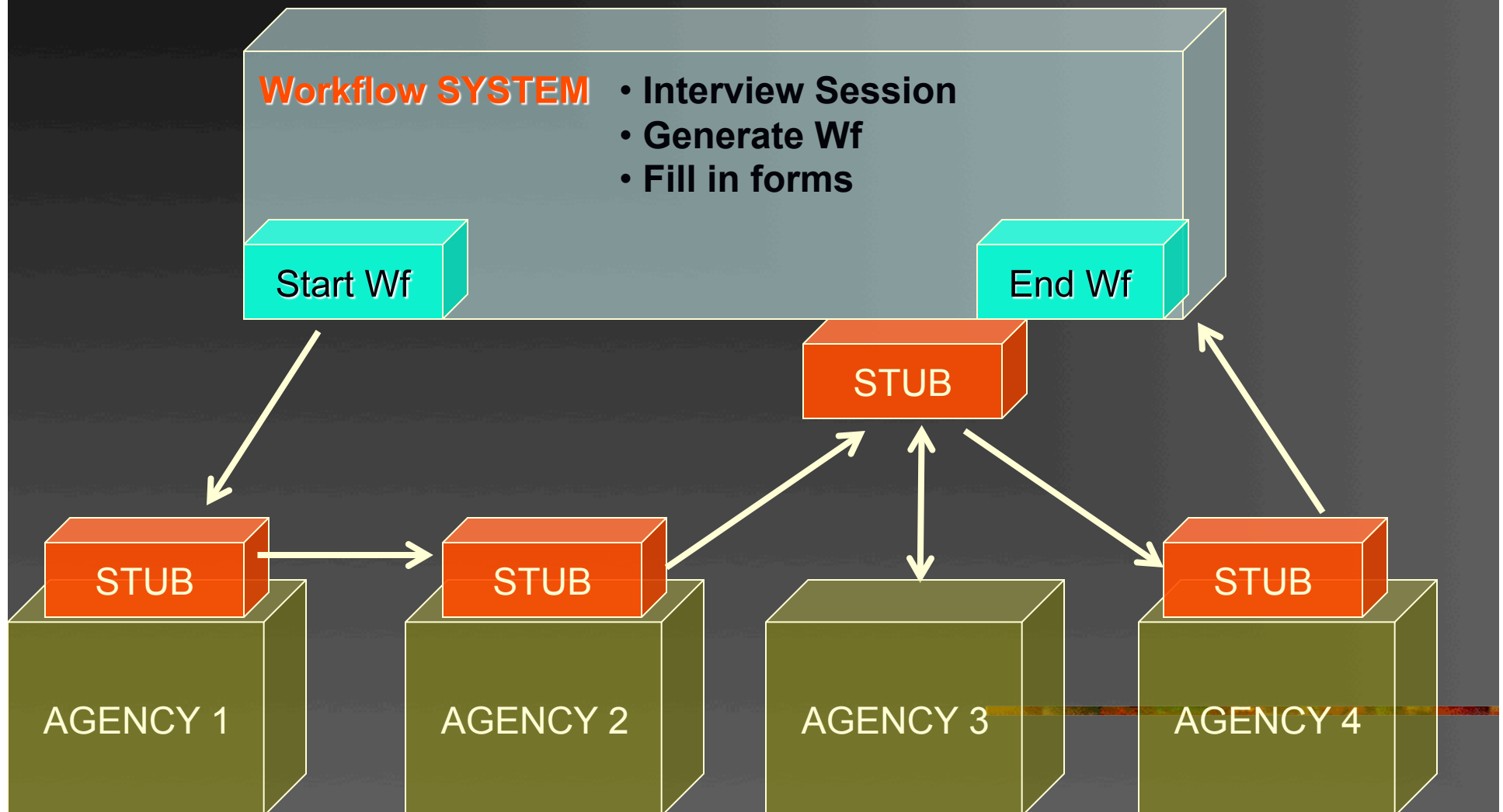
Workflow Execution

Issues in Workflow Execution

- How to propagate information from one agency to the other, while preserving existing online services and autonomous systems

- Customize solutions to fit agency's service environment

- Monitoring the complete process
- Scalable Prototype
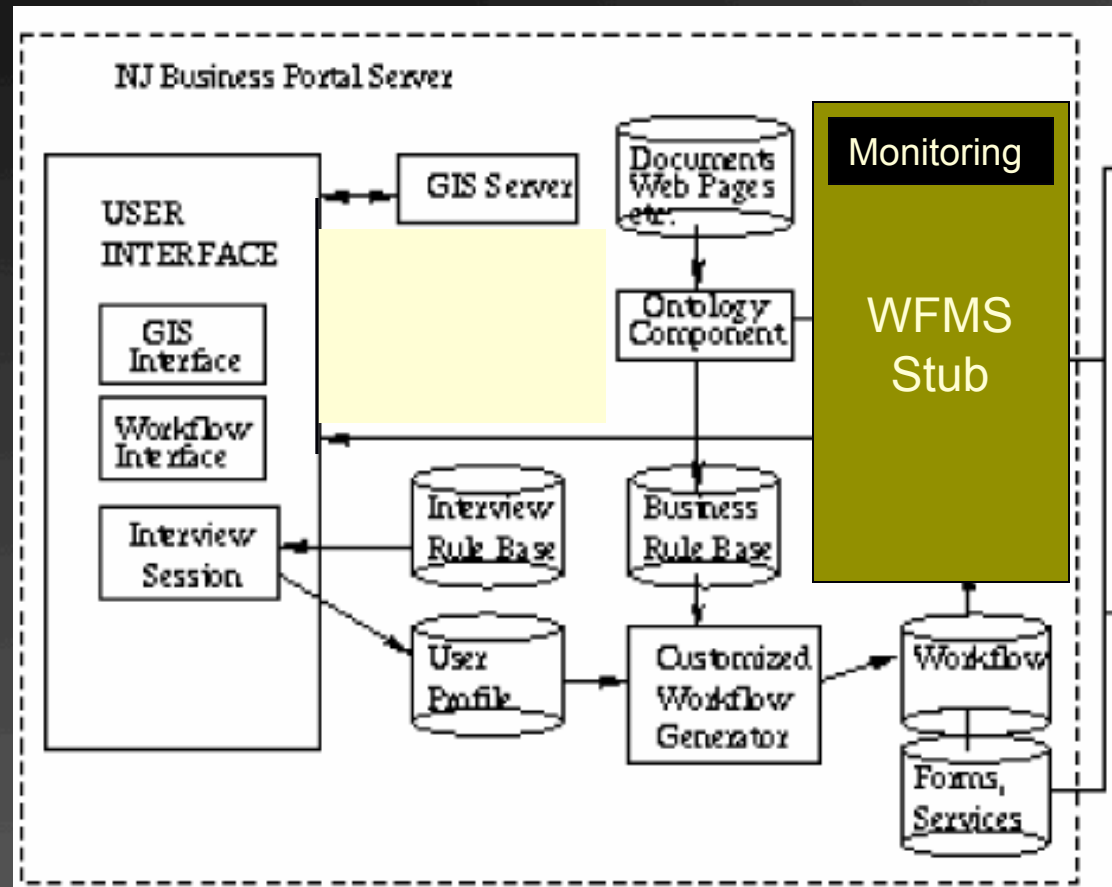
"Business Application" Workflow Execution Model

- Build on existing systems
- preserve the autonomy of each agency

"Business Application" Workflow Execution Model

Workflow SYSTEM
- Interview Session
- Generate Wf
- Fill in forms

Start Wf

End Wf

STUB

STUB

STUB

STUB

STUB

AGENCY 1

AGENCY 2

AGENCY 3

AGENCY 4

Workflow Execution

Flexible level of participation

- By Email
- Connection and Storage
- Application interaction
- Allow interaction with other services in agencies

Choosing a Business Location

Research Work 3: Interactive-maps
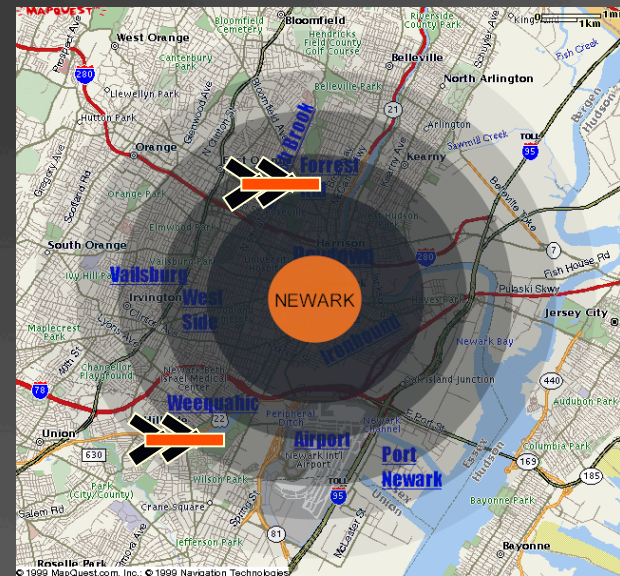
Location, Location, Location

Business location

- Are there any competing businesses close to my location?
- Is the site strategically located to reach my customer base?
- Clients, employees: demographic data, housing availability
- What is the infrastructure: transportation, parking space…
- Future expansion possibility, Crime statistics, traffic patterns.
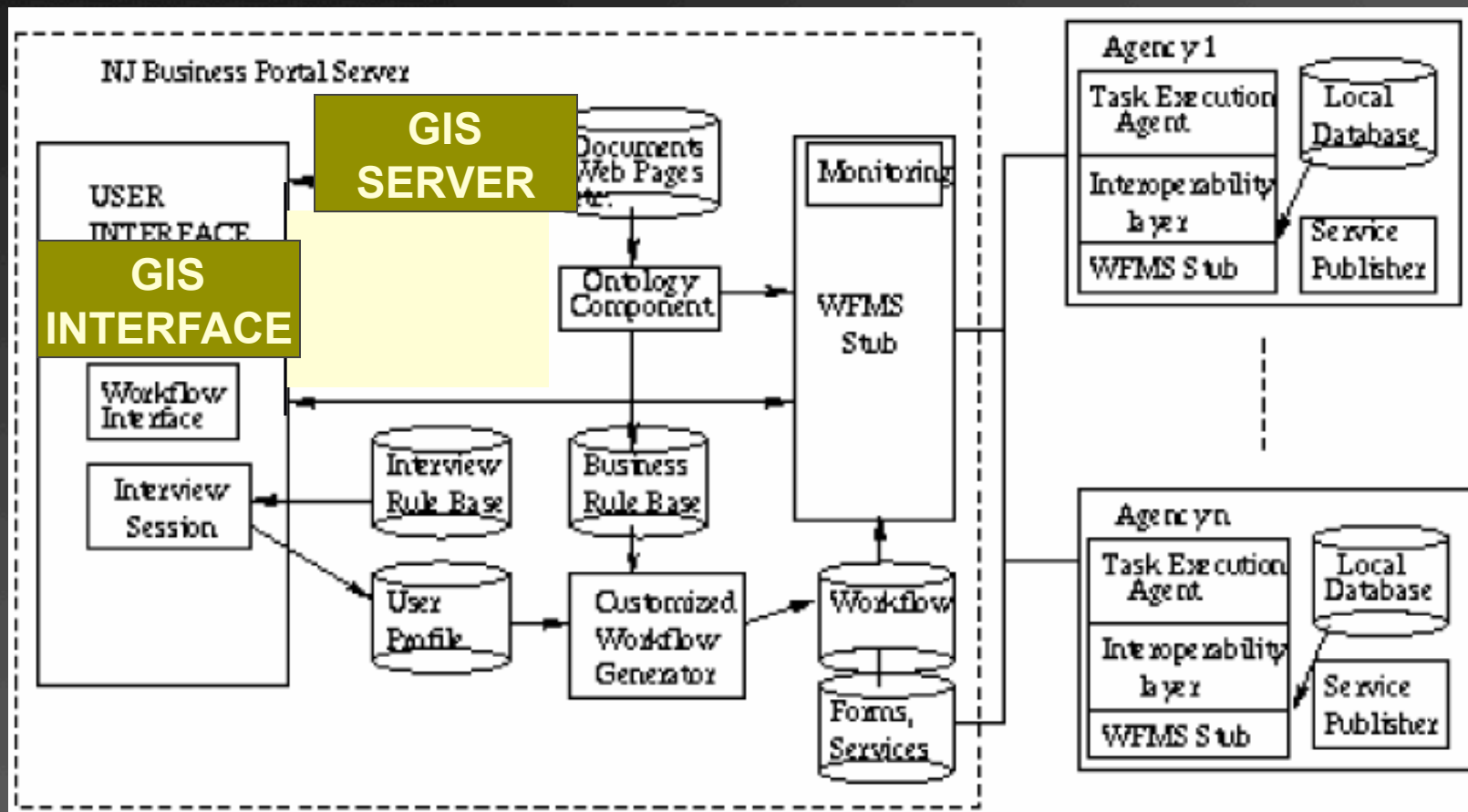- Zoning Regulations.

Entrepreneur

Newark

Business Location

GIS Interactive Maps

In Summary,

- Automatic Extraction of Regulations from documents
- Automatically Determining necessary Steps and identifying forms customized for each entrepreneur
- Reducing redundant entry of business information
- Automatic submission of information to the relevant agency in the right order
- Flexible level of agency participation
- Providing information that helps in identifying business location

http://ebiquity.umbc.edu/

Ebiquity @ UMBC

"Building intelligent, adaptive systems
for open, mobile and pervasive environments."

Faculty

Scott Cost

Tim Finin

Anupam Joshi

Hillol Kargupta

John Pinkston

Zary Segal

Alan Sherman

Yelena Yesha

Students

~ 10 PhD

~ 12 MS

~ 5 Undergrad
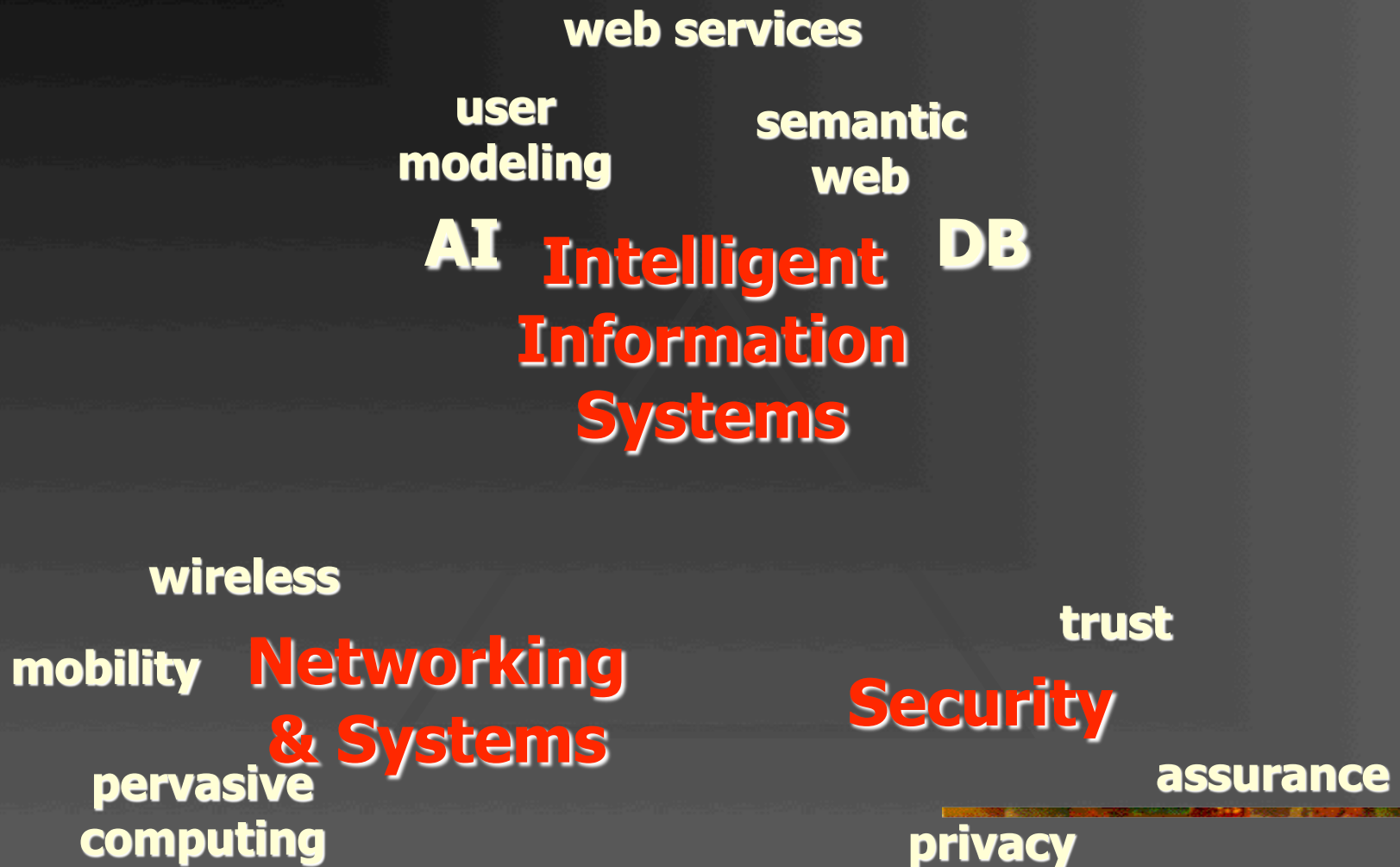
Partners

DARPA

NSF

NIST

NSA

IBM

Fujitsu

HP

Aether

eBiquity Group Technical Roots

web services

user
modeling

semantic
web

AI

**Intelligent
Information
Systems**

DB

wireless

trust

mobility

**Networking
& Systems**

Security

pervasive
computing

assurance

privacy

Research at UMBC

- Wireless Sensor Network Security
- Security in heterogeneous WSNs
- Secure Key Management
- Intrusion Detection
- Multi-level Wireless Security
- Service Discovery and Composition
- Routing in mobile ad-hoc networks